What is claimed is:

1. A device for aspirating and dispensing liquid samples comprising a pump that comprises a cylindrical chamber, a piston movable

5   in this cylindrical chamber and a piston drive that engages the piston, the device further comprising a pulse generator that effects dispensing of samples from a liquid by generating pressure waves in this liquid, and a tip connected to the cylindrical chamber with a line, wherein the piston drive comprises a first drive

10 and a second drive used as the pulse generator, and wherein the device also comprises a channel for flushing or rinsing the cylindrical chamber, and the channel discharges into the cylindrical chamber.

15 2. The device according to Claim 1, wherein the cylindrical chamber, piston, line, and tip define a space therebetween that is filled with an essentially coherent liquid column in the presence or absence of an air gap, and the volume of a liquid sample dispensed is determined solely by the parameters of one single pulse gen-

20 erated by the pulse generator.

3. The device according to Claim 1, wherein the first drive comprises a first plate movable with a spindle connected thereto and the second drive comprises a second plate connected with the

25 first plate by the pulse generator and engages the piston.

4. The device according to Claim 2, wherein the first drive comprises a first plate movable with a spindle connected thereto and the second drive comprises a second plate connected with the

30 first plate by the pulse generator and engages the piston.

5. A device according to claim 1, 2, 3 or 4, wherein the cylindrical chamber has a volume of between 5 and 200 µl.

6.   A device according to claim 1, 2, 3 or 4, wherein the pulse gen-
      erator comprises a reloaded stack of piezoelectric elements.

5   7.   A device according to claim 1, 2, 3 or 4, wherein the tip is a dis-
      posable tip or needle for pipetting liquids.

8.   A system for aspirating and dispensing liquid samples, comprising
      a plurality of devices according to claims 1, 2, 3 or 4.

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9.   A system for aspirating and dispensing liquid samples, comprising
      a plurality of devices according to claim 5.

10.   A system for aspirating and dispensing liquid samples, comprising
15   a plurality of devices according to claim 6.

11.   A system for aspirating and dispensing liquid samples, comprising
      a plurality of devices according to claim 7.

20   12.   A system according to claim 8 comprising n pumps, n line, and n
      tips, a first drive and a second drive having m pulse generators,
      wherein n is a whole number selected from 8, 96, or 384 and m
      is a whole number selected from 1, 2, or 3.

25   13.   A system according to claims 9, 10, 11 or 12 comprising n
      pumps, n line, and n tips, a first drive and a second drive having
      m pulse generators, wherein n is a whole number selected from
      8, 96, or 384 and m is a whole number selected from 1, 2, or 3.

30   14.   A system according to Claim 12, comprising an array of pumps
      and tips arranged in parallel to one another, wherein the array
      corresponds in layout and format of a microplate having 96, 384,
      864, 1536, or more wells.

15. A system according to Claim 13, comprising an array of pumps and tips arranged in parallel to one another, wherein the array corresponds in layout and format of a microplate having 96, 384,

5   864, 1536, or more wells.

16. A system according to Claim 8, comprising an array of 96, 384, or more pumps, lines, and tips, arranged in parallel to one another, a first drive, comprising at least three spindles acting on a joint first plate, and a second drive, comprising at least three

10   pulse generators, each having a preloaded stack of piezoelectric elements, with the second drive additionally comprising a second plate connected to the first plate via the three pulse generators and that engages all three pistons simultaneously.

15   17. A system according claim 9, 10 or 11, comprising an array of 96, 384, or more pumps, lines, and tips, arranged in parallel to one another, a first drive, comprising at least three spindles acting on a joint first plate, and a second drive, comprising at least three pulse generators, each having a preloaded stack of piezoelectric

20   elements, with the second drive additionally comprising a second plate that is connected to the first plate by the three pulse generators and that engage all three pistons simultaneously.

18. A system according to Claim 14, comprising an array of 96, 384,

25   or more pumps, lines, and tips, arranged in parallel to one another, a first drive, comprising at least three spindles acting on a joint first plate, and a second drive, comprising at least three pulse generators, each having a preloaded stack of piezoelectric elements, with the second drive additionally comprising a second

30   plate that is connected to the first plate by the three pulse generators and that engage all three pistons simultaneously.

19. A system according to one of the Claims 16 or 18 comprising a channel system that discharges into each of the cylindrical chambers.

5   20. A system according to Claim 17, comprising a channel system that discharges into each of the cylindrical chambers.

21. A system according to Claim 8, wherein the tips are tip plates (16, 16') that can be removed or automatically picked up and
10   discarded.

22. A system according to claim 12, wherein the tips are tip plates (16, 16') that can be removed or automatically picked up and discarded.
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23. A system according to claim 13 or 14, wherein the tips are tip plates (16, 16') that can be removed or automatically picked up and discarded.

20   24. A system according to Claim 8, further comprising a computer for controlling the aspiration and dispensing of liquid samples.

25. A system according to Claim 9, 10 or 11, further comprising a computer for controlling the aspiration and dispensing of liquid
25   samples.

26. A system according to Claim 12, further comprising a computer for controlling the aspiration and dispensing of liquid samples.

30   27. A system according to Claims 13 or 14, further comprising a computer for controlling the aspiration and dispensing of liquid samples.

28. A system according to Claim 21, further comprising a computer for controlling the aspiration and dispensing of liquid samples.